

Amendments in the specification:

1) On line 1 of page 1, please change the title of this application from "Polymer Composition" to "Polymer Electrolyte Having Acidic, Basic and Elastomeric Subunits".

2) Please replace the paragraph beginning on line 18 of page 4 with the following paragraph:

Figure 3 compares the proton ~~pretren~~ conductivity as a function of temperature for the prior art Nafion® membrane as compared to an embodiment of the invention wherein the membrane comprises 81.5% sPEEK, 15.5% PBI and 3% PAN.

3) Please replace the paragraph beginning on line 15 of page 5 with the following paragraph:

As A used herein, the term "acidic polymer" refers to a polymeric backbone which contains one or more acidic subunits. In a preferred embodiment, the backbone contains carbon alone or in combination with oxygen, nitrogen or sulfur. Particularly preferred embodiments include aromatic backbones although aliphatic ~~apliphatie~~ polymers may also be used. More particularly, an acidic polymer contains acidic subunits which preferably comprise acidic groups including sulphonic acid, phosphoric acid and carboxylic acid groups. Examples of polymers containing sulfonic acid group include perfluorinated sulfonated hydrocarbons, such as Nafion®; sulfonated aromatic polymers such as sulfonated polyetheretherketone (sPEEK), sulfonated polyetherethersulfone (sPEES), sulfonated polybenzobisbenzazoles, sulfonated polybenzothiazoles,

sulfonated polybenzimidazoles, sulfonated polyamides, sulfonated polyetherimides, sulfonated polyphenyleneoxide, sulfonated polyphenylenesulfide, and other sulfonated aromatic polymers. The sulfonated aromatic polymers may be partially or fully fluorinated. Other sulfonated polymers include polyvinylsulfonic acid, sulfonated polystyrene, copolymers of acrylonitrile and 2-acrylamido-2-methyl-1 propane sulfonic acid, acrylonitrile and vinylsulfonic acid, acrylonitrile and styrene sulfonic acid, acrylonitrile and methacryloxyethyleneoxypropane sulfonic acid, acrylonitrile and methacryloxyethyleneoxytetrafluoroethylenesulfonic acid, and so on. The polymers may be partially or fully fluorinated. Any class of sulfonated polymer includes ~~include~~ sulfonated polyphosphazenes, such as poly(sulfophenoxy)phosphazenes or poly(sulfoethoxy)phosphazene. The phosphazene ~~phosplazene~~ polymers may be partially or fully fluorinated. Also included are ~~S~~sulfonated polyphenylsiloxanes and copolymers, poly(sulfoalkoxy)phosphazenes, and poly(sulfotetrafluoroethoxypropoxy) siloxane. In addition, copolymers of any of the polymers can be used. It is preferred that the SPEEK be sulfonated between 60 and 200%, more preferably between 70 to 150% and most preferably between 80 to 120%. In this regard, 100% sulfonated indicates one sulfonic acid group per polymer repeating unit.

4) Please replace the paragraph beginning on line 19 of page 13 with the following paragraph:

The polymer membranes ~~membrane~~ of the invention also find use as separators in batteries ~~bateries~~. Particularly preferred batteries are lithium ion batteries.

1) Comments on amendments to the claims

The claims are amended to more clearly define and claim the present invention as follows:

Claim 1 is amended to recite "wherein said basic subunits are selected from the group consisting of vinylimidazole, benzothiazoles, quinolines, ethyleneimines, vinylpyridine, allylamine, and mixtures thereof". Support for this amendment is present in the specification as filed, for example from line 26 of page 6 to line 8 of page 7.

Claim 11 is written in independent form and amended to recite "wherein said membrane has an electrical conductivity greater than about 0.005 S/cm". Support for this amendment is present in the specification as filed, for example on lines 10-12 of page 11, and on Figure 3.

New claim 35 is presented and recites "wherein said acidic subunits are selected from the group consisting of sulfonic acid groups, phosphoric acid groups and mixtures thereof, wherein said elastomeric subunits are selected from the group consisting of nitrile groups, vinylidene fluoride groups, siloxane groups, phosphazine groups, and mixtures thereof". Support for these limitations is present in the specification as filed, for example on lines 19-20 of page 5 and on lines 16-18 of page 7.

Claims 13-34, presently standing withdrawn, are canceled without prejudice.

In addition, minor informalities in claim language that have been noticed at this time are corrected.

No new matter is introduced.

2) Comments on amendments to the specification

The specification is currently amended to provide a more descriptive title. In addition, the specification is currently amended to correct minor informalities that have been noticed at this time. No new matter is introduced.

3) Change of docket number

This application has recently been transferred to our firm. Accordingly, it is respectfully requested that the docket number for this case be changed to SRI-107/US in the Office database.

4) Detailed action: Claim rejections under 35 USC 102

Claims 1, 2, 4-6, and 11-12 stand rejected under 35 USC 102(e) as anticipated by US 6,465,136, hereinafter Fenton. Claim 3 is not explicitly considered in the detailed office action, but is indicated as rejected in the Office Action Summary. For the record, it is assumed that claim 3 has been rejected as anticipated by Fenton.

Claim 1 is currently amended to more clearly define the present invention. In particular, the claimed basic subunits are limited by "wherein said basic subunits are selected from the group consisting of vinylimidazole, benzothiazoles, quinolines, ethyleneimines, vinylpyridine, allylamine, and mixtures thereof". Fenton does not teach or suggest these basic subunits. Accordingly, withdrawal of this rejection of claim 1 is respectfully requested.

Claims 2, 5-6, and 12 depend from claim 1, so the above amendment of claim 1 is also responsive to this rejection of claims 2, 5-6, and 12.

Claim 3 depends from claim 1, so the above amendment of claim 1 is also responsive to this assumed rejection of claim 3.

Claim 4 is canceled without prejudice.

Claim 11 is amended to more clearly define the present invention. In particular, the electrical conductivity is limited to "wherein said membrane has an electrical conductivity greater than about 0.005 S/cm". Fenton does not teach or suggest a way to provide such electrical conductivity in a polymer membrane. Accordingly, withdrawal of this rejection of claim 11 is respectfully requested.

New claim 35 is presented, reciting limitations to "wherein said acidic subunits are selected from the group consisting of sulfonic acid groups, phosphoric acid groups and mixtures thereof, wherein said elastomeric subunits are selected from the group consisting of nitrile groups, vinylidene fluoride groups, siloxane groups, phosphazine groups, and mixtures thereof". Fenton does not teach or suggest a polymer membrane having this limitation. Accordingly, Applicant regards claim 35 as patentable over Fenton.

5) Detailed action: Claim rejections under 35 USC 102

Claims 1, 2, 4, 6-8, and 11-12 stand rejected under 35 USC 102(e) as anticipated by US 6,214,251, hereinafter Wu.

Claim 1 is currently amended to more clearly define the present invention. In particular, the claimed basic subunits are limited by "wherein said basic subunits are selected from the group consisting of vinylimidazole, benzothiazoles, quinolines, ethyleneimines, vinylpyridine, allylamine, and mixtures thereof". Wu does not teach or suggest these basic subunits. Accordingly, withdrawal of this rejection of claim 1 is respectfully requested.

Claims 2, 6-8, and 12 depend from claim 1, so the above amendment of claim 1 is also responsive to this rejection of claims 2, 6-8, and 12.

Claim 4 is canceled without prejudice.

Claim 11 is amended to more clearly define the present invention. In particular, the electrical conductivity is limited to "wherein said membrane has an electrical conductivity greater than about 0.005 S/cm". Wu does not teach or suggest a way to provide such electrical conductivity in a polymer membrane. In particular, the membranes given in the examples of Wu all have a conductivity that is less than 0.001 S/cm, which is significantly less than the claimed conductivity range. Accordingly, withdrawal of this rejection of claim 11 is respectfully requested.

New claim 35 is presented, reciting limitations to "wherein said acidic subunits are selected from the group consisting of sulfonic acid groups, phosphoric acid groups and mixtures thereof, wherein said elastomeric subunits are selected from the group consisting of nitrile groups, vinylidene fluoride groups, siloxane groups, phosphazine groups, and mixtures thereof". Wu does not teach or suggest a polymer membrane having this

limitation. Accordingly, Applicant regards claim 35 as patentable over Wu.

6) Detailed action: Claim rejections under 35 USC 102

Claims 1, 2, 4-6, and 11-12 stand rejected under 35 USC 102(e) as anticipated by US 6,248,480, hereinafter Narang.

Claim 1 is currently amended to more clearly define the present invention. In particular, the claimed basic subunits are limited by "wherein said basic subunits are selected from the group consisting of vinylimidazole, benzothiazoles, quinolines, ethyleneimines, vinylpyridine, allylamine, and mixtures thereof". Narang does not teach or suggest these basic subunits. Accordingly, withdrawal of this rejection of claim 1 is respectfully requested.

Claims 2, 5-6, and 12 depend from claim 1, so the above amendment of claim 1 is also responsive to this rejection of claims 2, 5-6, and 12.

Claim 4 is canceled without prejudice.

Claim 11 is amended to more clearly define the present invention. In particular, the electrical conductivity is limited to "wherein said membrane has an electrical conductivity greater than about 0.005 S/cm". Narang does not teach or suggest a way to provide such electrical conductivity in a polymer membrane. Accordingly, withdrawal of this rejection of claim 11 is respectfully requested.

New claim 35 is presented, reciting limitations to "wherein said acidic subunits are selected from the group consisting of sulfonic acid groups, phosphoric acid groups and mixtures thereof, wherein said elastomeric subunits are selected from the group consisting of nitrile groups, vinylidene fluoride groups, siloxane groups, phosphazine groups, and mixtures thereof". Narang does not teach or suggest a polymer membrane having this limitation. Accordingly, Applicant regards claim 35 as patentable over Narang.

7) Detailed action: Claim rejections under 35 USC 102

Claims 1, 2, 4, and 6-8 stand rejected under 35 USC 102(b) as anticipated by EP 900,834, hereinafter Tagoshi.

Claim 1 is currently amended to more clearly define the present invention. In particular, the claimed basic subunits are limited by "wherein said basic subunits are selected from the group consisting of vinylimidazole, benzothiazoles, quinolines, ethyleneimines, vinylpyridine, allylamine, and mixtures thereof". Tagoshi does not teach or suggest these basic subunits. Accordingly, withdrawal of this rejection of claim 1 is respectfully requested.

Claims 2 and 6-8 depend from claim 1, so the above amendment of claim 1 is also responsive to this rejection of claims 2 and 6-8.

Claim 4 is canceled without prejudice.

New claim 35 is presented, reciting limitations to "wherein said acidic subunits are selected from the group consisting of

sulfonic acid groups, phosphoric acid groups and mixtures thereof, wherein said elastomeric subunits are selected from the group consisting of nitrile groups, vinylidene fluoride groups, siloxane groups, phosphazine groups, and mixtures thereof". Tagoshi does not teach or suggest a polymer membrane having this limitation. Accordingly, Applicant regards claim 35 as patentable over Tagoshi.

8) Detailed action: Allowable subject matter

Claims 9 and 10 stand as allowable, if rewritten in independent form.

Applicant appreciates this indication of allowable subject matter.